

## Teaming Up Against the Whitefly

Cooperation is the best word to describe how scientists, growers, and industry have managed to advance against the silverleaf whitefly. This month's cover story describes many technologies being delivered to those who need them to cope with this physically tiny but agriculturally huge pest.

Since 1986, the silverleaf whitefly, also known as biotype B of the sweetpotato whitefly, has inflicted massive losses on crops from alfalfa to zucchini. In 1992, it became the target of a national 5-year plan.

"The plan was a blueprint, a flexible one, that helped us decide what needed doing and who would do it," says Robert M. Faust. At the Agricultural Research Service, Faust is national program leader for field and horticultural crop entomology.

ARS led the plan's development along with the U.S. Department of Agriculture's Animal and Plant Health Inspection Service; USDA's Cooperative State Research, Education, and Extension Service; and state agricultural experiment stations and cooperative extension services at universities.

Whitefly troubles still abound, but technologies and management in some areas are reducing the damage.

"Most of the progress can be traced to new information from researchers, who have built a solid foundation for long-term management of this pest," Faust says.

Scientists presented about 575 summaries of studies during annual reviews of the plan from 1993 to 1996. To help researchers find existing information, scientists at ARS' Western Cotton Research Laboratory in Phoenix, Arizona, compiled a bibliography of nearly 3,000 citations.

Scientists are exploring new ways to turn information from studies into blueprints for action.

For example, Jon Allen and Carlyle Brewster at the University of Florida have come up with new tools for studying regional cropping systems. From satellite images, they built crop maps of key whitefly areas in California and Texas. This allows them to design and simulate experimental crop systems. Such systems could be a basis for recommending anti-whitefly strategies.

To disseminate study findings quickly and widely, several agencies and organizations established Internet sites. There, growers, industry, and the public have access to scientific projects, results, and experts.

But growers can't settle for just reading about progress. They have today and tomorrow to worry about. Early on, researchers and others with USDA, universities, and extension services formed local committees to advise growers in hard-hit areas.

One of these regional efforts shows how cooperation has glued together the elements of research, information delivery, and technology application. The effort began in 1993, when ARS, the University of Arizona, Arizona Department of Agriculture (ADA), Cotton Incorporated, and the Arizona Cotton Growers Association began producing whitefly-control guidelines. Commodity groups mailed these to growers.

In 1995, the guidelines led to a plan to slow the whitefly's notorious capacity to develop resistance to insecticides. The plan relied heavily on research, especially on findings needed to estimate whitefly numbers and set thresholds for crop damage.

The same year, a 200-acre trial was conducted by the ARS lab in Phoenix, the University of Arizona, and ARS' Southern Crops Research Laboratory in College Station, Texas.

The trial revealed the need for additional controls, because of the pest's increasing resistance to registered insecticides.

In response, the ADA—in cooperation with ARS, industry and grower groups, university scientists, Cotton Incorporated, and others—applied to the U.S. Environmental Protection Agency (EPA) for an emergency exemption to allow use of two insect growth regulators on Arizona cotton.

IGR's don't kill pests by poisoning them. Instead, they halt the immature pest's development, rendering it "forever young"—unable to mature and reproduce. IGR's typically have less impact on a pest's natural biological controls and wildlife than do conventional insecticides.

Data sources for the EPA application also included the University of California, Texas A&M University, University of Florida, and Arizona Cotton Research and Protection Council. EPA approved the application in time for the 1996 crop.

Last season, Arizona growers widely used the IGR's—buprofezin (Applaud) and pyriproxyfen (Knack). Most growers were able to manage whiteflies while reducing insecticide sprays. In tests, IGR's allowed 60 percent reductions in whitefly insecticides compared to 1995.

"The effort that culminated in the availability of the IGR's for 1996," says Thomas Henneberry, director of ARS' Phoenix laboratory, "led Arizona cotton growers to greatly change their whitefly management practices. It's likely to evolve to address new challenges growers face in the future."

A new, national cooperative action plan on whiteflies will be put in place this year. It will have a strong emphasis on technology transfer.

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